

US009408438B2

(12) United States Patent

(10) Patent No.: US 9,408,438 B2 (45) Date of Patent: Aug. 9, 2016

(54) ADJUSTING DEVICE FOR TIGHTENING OR LOOSENING LACE

LOOSENING LACE

- (71) Applicant: Chin-Chu Chen, Taichung (TW)(72) Inventor: Chin-Chu Chen, Taichung (TW)
- (*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

- (21) Appl. No.: 14/585,153
- (22) Filed: Dec. 29, 2014

(65) Prior Publication Data

US 2015/0230560 A1 Aug. 20, 2015

(30) Foreign Application Priority Data

Feb. 17, 2014 (TW) 103105138 A

(51) **Int. Cl.**

A43C 11/20 (2006.01) *A43C 7/02* (2006.01)

(52) U.S. Cl.

CPC . **A43C 11/20** (2013.01); **A43C 7/02** (2013.01); Y10T 24/2183 (2015.01)

(58) Field of Classification Search

CPC A43C 11/16; A43C 11/165; A45C 13/10; A61F 5/0018; A63C 10/06; A65H 75/4434; A65H 75/30; A41F 1/06; A41F 9/025; A45F 3/00; A45F 3/04; A45F 3/16; Y10T 24/37; Y10T 24/2187; Y10T 24/2187; Y10T 24/21; Y10T 24/2183 USPC 2/417, 418; 242/385.4; 24/16 R, 20 TT, 24/68 B, 68 R, 68 SK, 115 R, 712, 712.1, 24/712.2, 712.9, 713.2, 715.3, 909, 712.5, 24/71.1, 132 R, 132 AA, 712.4, 712.6; 254/223, 238, 239; 36/50.1

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

6,202,953 7,174,575 7,367,522 7,954,204 8,468,657 8,516,662 8,832,912 9,072,341 9,101,181 9,193,561	B1 * B2 * B2 * B2 * B2 * B2 * B2 * B2 *	2/2007 5/2008 6/2011 6/2013 8/2013 9/2014 7/2015 8/2015	Hammerslag	
9,193,561 2010/0101061			Yan et al. 24/712.5	
2010/0101061 2010/0251524		4/2010 10/2010	Ha	
(Continued)				

(Continued)

FOREIGN PATENT DOCUMENTS

DE 202010000354 U1 6/2010 JP 07-000208 A 1/1995

(Continued)

Primary Examiner — Robert J Sandy Assistant Examiner — Rowland Do

(74) Attorney, Agent, or Firm — CKC & Partners Co., Ltd.

(57) ABSTRACT

An adjusting device for tightening or loosening a lace is provided. The adjusting device includes a base, a knob and a releasing unit. The releasing unit is disposed in the base and the knob, and the knob is used for winding the lace. The releasing unit and the knob are pivotally disposed in an accommodating space. The releasing unit includes at least one elastic arm corresponding to an annular tooth in the knob. The releasing unit can be raised or lowered on the base. When the releasing unit is raised, the knob can be freely rotated; and when the releasing unit is lowered, the rotation of the knob is limited in a releasing direction.

4 Claims, 10 Drawing Sheets

